

Remarks

Claims 1-30 are pending. No amendments are presented with this Response.

Applicants respectfully request reconsideration and allowance of the application in view of the following remarks.

Drawings

According to the Office Action, formal drawing drawings (as "replacement sheets") must be submitted with this Response.

Accordingly, enclosed herewith are seven (7) sheets of formal drawings of FIGS. 1-9.

Rejection Under 35 U.S.C. § 102

Claims 1-30 stand rejected under 35 U.S.C. 102(e) as being anticipated by Sanada (U.S. Pat. No. 5,985,357).

This rejection is traversed because the Office Action does not indicate the pertinence of the Sanada reference to Applicants' claimed subject matter, and such pertinence is not apparent.

37 C.F.R. §1.104(c)(2)

37 C.F.R. §1.104(c)(2) promulgates requirements for an Office Action in rejecting claims for want of novelty or for obviousness, e.g., as follows:

When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified.

The Office Action does not properly indicate the pertinence of the complex Sanada reference to Applicants' claimed subject matter, and such pertinence is not apparent.

A brief review of the Sanada reference (including 13 Figures and 20 columns) indicates that it is a complex reference. For example, Figure 2 is a block diagram showing a substrate spin coating apparatus, Figure 6 is a flow chart showing an operation of a controller, and Figures 5, 8, 9, and 11 are time charts that have a great amount of detail such as program instructions and specific points of time in a process. Indeed, Figure 5 itself includes at least fourteen specific points of time on the time chart (t_1-t_{14}). Moreover, Figures 5-7, for example, are described together from at least column 9, line 28 to column 13, line 59.

The Office Action merely cites Figures 2, 5-9, and 11 of the Sanada reference and then summarily concludes that all pending claims 1-30 are anticipated by the Sanada reference as follows:

Sanada has a spin coating method and apparatus in which the timing of the substrate operations are controlled. The spin coating apparatus is shown in fig. 2. Figs. 5, 8, 9, and 11 show the timing charts for the apparatus and Fig. 6 and 7 show the flow charts for the apparatus. The method is such that the actual time of conditions and events are responded to based on sensor data and timer and clock. Based on sensor data the sequence of events may be modified, thus the sequence or series of operations may be modified by a signal to interrupt the operation and carry out a command.

However, the pertinence of the Office Action's bare citations to these Figures in the Sanada reference to the specific subject matter of one or more pending claims 1-30 is not apparent. In other words, the Office does not identify any specific portion of the Sanada reference as it may relate to the subject matter of any specific claim. The Office Action does not even refer to any of Applicants' claims specifically. For example, the Office Action does not identify how the Sanada reference is pertinent to the following exemplary features in Applicants' independent claims 1, 9, 10, 21, 22, 27, 28, 29, and 30:

- Claim 1 – “A method for controlling a process of applying a developer solution onto a substrate using a spin-coating apparatus, the method comprising... interrupting the serial process control with an interrupt signal to execute a process command”;

- Claim 9 – “A method for providing a photoresist coating onto a substrate, the method comprising: spin-coating a photoresist solution onto the substrate wherein the spin-coating process is controlled by a method comprising: ... interrupting the serial process control with an interrupt signal to execute a process command; and applying a developer solution onto the spin-coated photoresist using a spin-coating apparatus wherein the spin-coating apparatus is controlled by a method comprising:...interrupting the serial process control with an interrupt signal to execute a process command”;
- Claim 10 – “A method of spin-coating a developing solution onto a microelectronic device, the method comprising executing process commands at durations measured in parallel from an earlier process event”;
- Claim 21 – “A method of controlling a develop solution spin-coating process, the method comprising the use of a process control system programmed with an interrupt service routine, wherein upon a trigger event, a hardware interrupt is sent to the process control system, upon receipt of the hardware interrupt, the process control system executes an interrupt service routine, and wherein the interrupt service routine includes the steps of: setting two or more timers to run in parallel for durations, and sending a software interrupt at the end of each duration to interrupt the process control system and execute a process command”;
- Claim 22 – “A method of processing a microelectronic device, the method comprising the steps of: ... and spin-coating a developing solution onto the microelectronic device, the spin-coating method comprising interrupting serial process control to execute a process command”;
- Claim 27 – “A method of controlling a process for spin-coating a developer solution, the method comprising initiating two or more process commands at durations measured in parallel from one or more earlier process events, to avoid timing variabilities otherwise caused by serial timing methods”;

- Claim 28 – “A spin-coating apparatus comprising a process control system to control developer solution spin-coating steps comprising initiating process commands at durations measured in parallel from one or more earlier process events”;
- Claim 29 – “A spin-coating apparatus comprising: ... a process control system to control application of the developer solution onto the substrate, the process control system being programmed to interrupt serial control to execute a process command.”; and
- Claim 30 – “A spin-coating device comprising a process control system programmed to execute developer solution spin-coating processing steps comprising timing different process commands in parallel using two or more timers, to avoid accumulation of timing variability in processing commands caused by serial timing methods.” (Underlining added for emphasis).

In addition, the Office Action does not identify how the Sanada reference is pertinent to Applicants' dependent claims. For example, the Office Action does not address following features recited in dependent claims 2, 3, 5, 6, 12, and 13:

- Claim 2 – “wherein the interrupt signal is sent to a central processing unit of the process control system, and wherein upon receiving the interrupt signal the central processing unit executes an interrupt service routine”;
- Claim 3 – “wherein the interrupt service routine starts multiple timers, each timer measures a different duration, and at the end of each duration the interrupt service routine sends an interrupt signal to the central processing unit and the central processing unit executes a process command”;
- Claim 5 – “wherein the interrupt signal is a software interrupt signal”;
- Claim 6 – “wherein the interrupt signal is a hardware interrupt”;
- Claim 12 – “wherein each duration is controlled to within 5 milliseconds”; and
- Claim 13 – “wherein each duration is controlled to within 1 millisecond.” (Underlining added for emphasis).

Accordingly, it is respectfully requested that the rejection of claims 1-30 under 35 U.S.C. 102(e) as being anticipated by Sanada be withdrawn.

Conclusion

In view of the above remarks, it is respectfully submitted that the claims and the present application are in condition for allowance. Approval of the application and allowance of the claims is earnestly solicited. In the event that a phone conference between the Examiner and the Applicant's undersigned attorney would help resolve any remaining issues in the application, the Examiner is invited to contact said attorney at (651) 275-9831.

Respectfully Submitted,

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